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Self-wiring in neural nets of point-like cortical neurons fails to reproduce cytoarchitectural differences

Gafarov F.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

We propose a model for description of activity-dependent evolution and self-wiring between binary neurons. Specifically, this model can be used for investigation of growth of neuronal connectivity in the developing neocortex. By using computational simulations with appropriate training pattern sequences, we show that long-term memory can be encoded in neuronal connectivity and that the external stimulations form part of the functioning neocortical circuit. It is proposed that such binary neuron representations of point-like cortical neurons fail to reproduce cytoarchitectural differences of the neocortical organization, which has implications for inadequacies of compartmental models. © Imperial College Press.

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Keywords

Axon pathfinding, Brain development, Chemoattractants, Chemoreppelents, Growth cone, Neural circuits integration